

ORIGINAL

LAW OFFICES

KOTEEN & NAFTALIN, L.L.P.

1150 CONNECTICUT AVENUE  
WASHINGTON, D.C. 20036

BERNARD KOTEEN\*  
ALAN Y. NAFTALIN  
ARTHUR B. GOODKIND  
GEORGE Y. WHEELER  
MARGOT SMILEY HUMPHREY  
PETER M. CONNOLLY  
M. ANNE SWANSON  
CHARLES R. NAFTALIN  
GREGORY C. STAPLE  
R. EDWARD PRICE  
• SENIOR COUNSEL

POCKET FILE COPY ORIGINAL

RECEIVED

JAN 24 1997

FEDERAL COMMUNICATIONS COMMISSION  
OFFICE OF SECRETARY

TELEPHONE  
(202) 467-5700  
TELECOPY  
(202) 467-5915

January 24, 1997

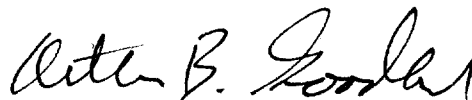
Mr. William F. Caton  
Acting Secretary  
Federal Communications Commission  
1919 M Street, N.W.  
Room 222  
Washington, DC 20554

Dear Mr. Caton:

Transmitted herewith, on behalf of Appalachian Broadcasting Corporation, are an original and nine copies of its "Reply Comments of Appalachian Broadcasting Corporation" filed in MM Docket No. 87-268.

In the event there are any questions concerning this matter, please contact the undersigned.

Sincerely,



Arthur B. Goodkind

Enclosure

No. of Copies rec'd  
List ABCDE

049

DOCKET FILE COPY ORIGINAL  
Before the  
Federal Communications Commission  
Washington, D.C. 20554

RECEIVED

JAN 24 1997

FEDERAL COMMUNICATIONS COMMISSION  
OFFICE OF SECRETARY

In the Matter of )  
 )  
Advanced Television Systems )  
and Their Impact Upon the ) MM Docket No. 87-268  
Existing Television Broadcast )  
Service )

TO: The Commission

REPLY COMMENTS OF  
APPALACHIAN BROADCASTING CORPORATION

Appalachian Broadcasting Corporation ("Appalachian"),  
licensee of television station WCYB-TV, Bristol, Virginia, files  
herewith, by its attorneys, its reply comments in the above-  
captioned proceeding.

In its opening comments filed in this proceeding on November  
22, 1996, Appalachian requested that the Commission allot Channel  
9 as WCYB-TV's digital channel during the period of transition  
from NTSC to DTV broadcasting. As set forth in our original  
comments and as set forth in further detail in the Engineering  
Statement attached to this reply, use of a VHF transition channel  
is expected to provide superior WCYB-TV service during the

transition period for many of the station's viewers who presently rely on reception of a signal diffracted over one of the many mountain ridges that characterize WCYB-TV's service area.

As set forth in our original comments, use of Channel 9 by WCYB-TV as a DTV transition channel will require innovative antenna design in order to protect existing Channel 9 stations in Charlotte, North Carolina, and Grandview, West Virginia. Consultations between Appalachian's communications consulting engineer and a leading television antenna manufacturer since Appalachian's opening comments were filed have now confirmed an antenna design that will fully protect both the Charlotte and Grandview co-channel stations. See attached Engineering Statement of Jules Cohen, at p. 5-6. Further work remains necessary, however, to refine this design so that WCYB-TV will attain the full signal coverage it seeks to achieve within its Designated Market Area ("DMA"). As indicated in the attached Engineering Statement, Appalachian's engineering consultant believes that it will be possible to attain this objective through use of an antenna design utilizing as many as five or six

elements spaced around the tower. Appalachian will further advise the Commission as this design work proceeds.<sup>1</sup>

Appalachian also wishes to indicate its strong support for the many commenting parties who urged the Commission to include Channels 2 through 6 within the "core" DTV channels to be retained for television use after the transition. As noted by Mr. Cohen in the attached Engineering Statement, channels 2 through 6 are uniquely well suited to television use in many respects, and particularly so in areas of rough mountainous terrain such as exists in WCYB-TV's television market. Indeed, as a classic study referred to in Mr. Cohen's statement has shown, in one non-extreme example of signal loss resulting from diffraction, low band VHF losses were shown to be less than six decibels, high band VHF losses were about nine decibels, and mid-UHF losses were approximately 13 decibels.

---

<sup>1</sup> Appalachian will proceed with this effort as expeditiously as possible. If the design effort should fail to achieve Appalachian's dual objective of both protecting co-channel stations and at the same time providing an adequate signal within WCYB-TV's own DMA, the Commission will be advised promptly and Appalachian would, at that point, accept the UHF transitional DTV allotment originally proposed for the station by the Commission.

A low-band VHF channel, such as WCYB-TV's present NTSC channel 5, are thus best suited for providing coverage in areas of rough mountainous terrain. If the Commission were to retain the low-band VHF channels in the core group, WCYB-TV would be able to return to Channel 5 following the transition and thereby optimize the DTV service it would provide to its viewers.

On the other hand, channels 2 through 6 would be less valuable for many other non-television uses. As set forth in the attached Engineering Statement:

Expansion of cellular type services providing two-way communications and data transmissions to and from portable devices is expected to drive demand [for recaptured television channels]. For such devices, the need for compact portable transceivers dictates the use of higher frequencies. In addition, the very propagation characteristics that make low-band VHF desirable for television are a detriment to efficient cellular-type services. The objective in cellular or PCS operations is to provide service in clearly defined cells and reuse the same frequency groups in other areas. To achieve that objective, signals that attenuate rapidly beyond line of sight are desirable. High UHF frequencies serve that need.

CONCLUSION

For the reasons set forth above, Appalachian reaffirms its request that WCYB-TV be allotted Channel 9 as a DTV transitional channel. Appalachian also supports those commenting parties who have urged the Commission to retain channels 2 through 6 among the core channels to be used permanently for DTV broadcasting after the transition to DTV has been completed.

Respectfully submitted,

APPALACHIAN BROADCASTING CORPORATION

By: Arthur B. Goodkind  
Arthur B. Goodkind

Koteen & Naftalin, L.L.P.  
1150 Connecticut Avenue, N.W.  
Suite 1000  
Washington, D.C. 20036  
(202) 467-5700

January 24, 1997

**ENGINEERING STATEMENT ON BEHALF OF  
APPALACHIAN BROADCASTING CORPORATION  
IN SUPPORT OF REPLY COMMENTS  
SIXTH FURTHER NOTICE OF PROPOSED RULE MAKING  
MM DOCKET NO. 87-268**

This engineering statement was prepared on behalf of Appalachian Broadcasting Corporation, licensee of television broadcast station WCYB-TV ("WCYB"), Bristol, Virginia, in support of reply comments directed to the Sixth Further Notice of Proposed Rule Making in the Matter of Advanced Television Systems and Their Impact on the Existing Television Broadcast Service.

In a November 15, 1996, engineering statement by the undersigned, support was provided for assignment of channel 9 to WCYB-TV in place of channel 23 as proposed by the Commission. In the instant statement, further support for the assignment of channel 9 is set forth, a preference is stated for permission to return to channel 5 after the transition period, and progress is described in the process of achieving an antenna design that satisfies two objectives: protection of cochannel NTSC stations and replication of WCYB-TV service in areas of principal importance.

The Tri-Cities area, including the principal cities Bristol, Virginia and Tennessee, Kingsport, Tennessee, and Johnson City, Tennessee, and the surrounding area that looks

*Jules Cohen, P.E.*  
*Consulting Engineer*

---

Engineering Statement  
WCYB-TV, Bristol, Virginia

Page 2

to the Tri-Cities as its commercial center, ranks among the most difficult in the nation to serve with over-the-air television. Severe terrain irregularities abound. Despite the availability of elevated locations for transmitter locations, line-of-sight is available to a relatively small number of homes. Over-the-air service, particularly in rural areas most in need of service, has to be supplied by signals diffracted over terrain obstructions. Theory and practice both point to the fact that lower frequencies suffer less diffraction loss than higher frequencies. As frequency increases, transmission becomes more and more like light rays. In one example (not extreme) of diffraction, low band VHF loss would be less than six decibels, high band VHF loss would be about nine decibels, and mid-UHF band loss would be approximately thirteen decibels.<sup>1</sup> From the foregoing, the advantage of VHF, and particularly low-band VHF, in irregular terrain is clear. The additional diffraction loss penalty at UHF deprives potential viewers of the station's service.

In the real world of television viewing, that factor of lower diffraction loss has been confirmed by WCYB experience. Many homes in the hollows of Tennessee, Virginia, Kentucky and West Virginia can receive no off-air reception other than from WCYB-TV.

---

<sup>1</sup> Based on the classic paper by Kenneth Bullington, Radio Propagation at Frequencies Above 30 Megacycles, *Proceedings of the I.R.E.*, October 1947, pages 1122, *et seq.*



*Jules Cohen, P.E.*  
*Consulting Engineer*

---

Engineering Statement  
WCYB-TV, Bristol, Virginia

Page 3

Retention of channels 2 through 6 for television broadcasting is of special importance to viewing audiences in areas of irregular terrain like those served by WCYB. Although use of low VHF may not be feasible during the transition period, return to channel 5 after transition, when digital television is the only transmission mode in use, would be most desirable to assure continuing service to those reliant upon low-VHF service.

Continued use of channels 2 through 6 for television is likely to be the use most benefitting United States citizens. The adverse reaction generated in some minds because of problems perceived to be encountered by use of channel 6 in the Charlotte, North Carolina, field tests of digital television is not justified. The two factors most affecting channel 6 adversely were impulse noise and interference from noncommercial FM stations operating in the spectrum region just above television channel 6. But both the NTSC and digital TV operations were being conducted at output power levels only one-tenth of what would be normal practice. The NTSC effective radiated power level was held to only 10 kilowatts, in contrast to the usual 100 kilowatts for low VHF, in order to minimize the possible impact of the experimental operation on licensed NTSC stations. Since an objective of the field testing was to compare NTSC and digital TV performance, the digital transmissions were also kept lower than to be expected in practice. These lower than normal transmitted powers made reception more susceptible to interference from any

*Jules Cohen, P.E.*  
*Consulting Engineer*

---

Engineering Statement  
WCYB-TV, Bristol, Virginia

Page 4

source. The Charlotte field testing on channel 6 showed that the digital operation was less susceptible to interference from either impulse or adjacent channel FM than NTSC operation. Employment of low band VHF for digital operation at levels replicating NTSC service will permit exploiting the better propagation characteristics of the lower frequencies with fewer interference problems than experienced with NTSC.

From the viewpoint of spectrum recovery after the transition to an all-digital television service, retention of channels 2 through 6 for television is likely to have less impact than retention of upper UHF channels. Demand for spectrum is likely to be strongest in the region above 700 MHz. Expansion of cellular type services providing two-way communications and data transmissions to and from portable devices is expected to drive demand. For such devices, the need for compact portable transceivers dictates the use of the higher frequencies. In addition, the very propagation characteristics that make low-band VHF desirable for television are a detriment to efficient cellular-type services. The objective in cellular or PCS operations is to provide service in clearly defined cells and reuse the same frequency groups in other areas. To achieve that objective, signals that attenuate rapidly beyond line of sight are desirable. High UHF frequencies serve that need.

*Jules Cohen, P.E.*  
*Consulting Engineer*

---

Engineering Statement  
WCYB-TV, Bristol, Virginia

Page 5

During the transition period, when low-band VHF channels are not likely to be available for all stations operating on channels 2 through 6, the next best choice is high-band VHF. Specifically for WCYB, in a region with abundant irregular terrain, use of the VHF band for digital television is most important if its viewers can be expected to retain service from the station using receivers capable of employing the digital channel transmissions.

In the VHF band, channel 9 offers the best possibility for use by WCYB. To permit the use of channel 9 at Bristol without causing interference to cochannel operations in Charlotte, North Carolina, (WSOC-TV) and Grandview, West Virginia, (WSWP-TV) an innovative antenna design is required with consideration to both horizontal and vertical plane directivity. Working with an antenna manufacturer, a preliminary antenna design has been achieved demonstrating that WSOC-TV and WSWP-TV NTSC service areas can be protected. What remains to be done on the design is refinement of the service provided in the WCYB viewing area. That refinement requires more engineering time than has been available to date. Work on the improved design will continue with the antenna manufacturer on an expedited basis. Upon achieving the improvement desired, a supplementary statement will be submitted to the Commission with a complete description of the antenna, together with an analysis of protection and service provided.

*Jules Cohen, P.E.*  
*Consulting Engineer*

---

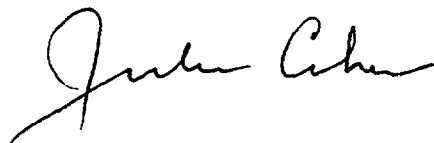
Engineering Statement  
WCYB-TV, Bristol, Virginia

Page 6

Achievement of the dual objective of protecting the cochannel stations and continuing to provide service to the WCYB audience is feasible. As evidenced by the counties in its Designated Market Area (DMA), the WCYB audience is found in the states of Tennessee, Virginia, West Virginia and Kentucky. The bearings toward WSOC-TV (136 degrees) and WSWP-TV (31 degrees) permit the antenna pattern to be suppressed toward those stations while still directing substantial power toward the desired service areas. The preliminary antenna design which, as noted, provides the degree of protection needed, uses four elements around the tower. To achieve a smoother main beam pattern providing more uniform service, the final design may require five or six elements spaced around the tower.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on January 2, 1997.

A handwritten signature in black ink, appearing to read "Jules Cohen", with a stylized, cursive script.

Jules Cohen, P.E.